(12) $\frac{2yx^{-\frac{4}{3}}}{2xy^2} = x^{-\frac{4}{3}-1}y^{1-2} = x^{-\frac{7}{3}}y^{-1} = \frac{1}{x^{\frac{7}{3}}y} \cdot \frac{\sqrt[3]{x^2}}{\sqrt[3]{x^2}} = \boxed{\frac{\sqrt[3]{x^2}}{yx^3}}$

(13) $-\sqrt[3]{2} - \sqrt[3]{2} - \sqrt[3]{16}$ ($16 = 8 \cdot 2$)

$-\sqrt[3]{2} - \sqrt[3]{2} - 2\sqrt[3]{2}$

$\boxed{-4\sqrt[3]{2}}$

(14) $-\sqrt[3]{16} - \sqrt[3]{2} - \sqrt[3]{-2}$ ($16 = 8 \cdot 2$, $-2 = -1 \cdot 2$)

$-2\sqrt[3]{2} - \sqrt[3]{2} - -\sqrt[3]{2}$

$\boxed{-2\sqrt[3]{2}}$

(15) $\frac{\sqrt[3]{25}}{4\sqrt[3]{-135}} = \frac{\sqrt[3]{25}}{4\sqrt[3]{-1 \cdot 27 \cdot 5}} = \frac{\sqrt[3]{25}}{-12\sqrt[3]{5}} = \boxed{\frac{\sqrt[3]{5}}{-12}}$ ($-135 = -1 \cdot 3^3 \cdot 5$)

(16) $\frac{5\sqrt[3]{648}}{5\sqrt[3]{8}} = \boxed{2}$

(17) $5\sqrt{15} \cdot \sqrt{20} = 5\sqrt{300}$

$= 5\sqrt{100} \cdot \sqrt{3}$

$\boxed{50\sqrt{3}}$

(18) $\sqrt[4]{8r^3} \cdot \sqrt[4]{320r^4}$

$\sqrt[4]{2560r^7}$

$\sqrt[4]{256} \cdot \sqrt[4]{10} \cdot \sqrt[4]{r^{r3}}$

$\boxed{4r\sqrt[4]{10r^3}}$

(19) $-3\sqrt[4]{20m^4} \cdot \sqrt[4]{4m}$

$-3\sqrt[4]{80m^5}$

$-3\sqrt[4]{16} \cdot \sqrt[4]{5} \cdot \sqrt[4]{m^{5m}}$

$\boxed{-6m\sqrt[4]{5m}}$

(20) $\sqrt[5]{9b^6} \cdot -5\sqrt[5]{54b}$

$-5\sqrt[5]{486b^7}$

$-5\sqrt[5]{243} \cdot \sqrt[5]{2} \sqrt[5]{b^{b2}}$

$\boxed{-15b\sqrt[5]{2b^2}}$

(21) $-8\sqrt[3]{875a^3b^8}$

$-8\sqrt[3]{125}\sqrt[3]{7}\sqrt[3]{a^a}\sqrt[3]{b^{b2}}$

$\boxed{-40ab^2\sqrt[3]{7b^2}}$

(22) $-3\sqrt[7]{896x^2y^3}$

$-3\sqrt[7]{128}\sqrt[7]{7}\sqrt[7]{x^2}\sqrt[7]{y^3}$

$\boxed{-6\sqrt[7]{7x^2y^3}}$

(23) $-2\sqrt[3]{256x^3y}$ x

$-2\sqrt[3]{64 \cdot 4}\sqrt[3]{x^3}\sqrt[3]{y}$

$\boxed{-8x\sqrt[3]{4y}}$

(24) $-4\sqrt[3]{-162a^2b}$

$-4\sqrt[3]{-1}\sqrt[3]{27}\sqrt[3]{b}\sqrt[3]{a^2}\sqrt[3]{b} = \boxed{12\sqrt[3]{ba^2b}}$